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The Performance of Venture Capital Investments

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9 The performance of venture capital investments

Benoit F. Leleux

Introduction

Venture capital is an interesting industry in which at least 75 per cent of the players you talk to are top quartile performers . . .

This tongue-in-cheek reference by a leading institutional investor (who preferred to remain anonymous) points not only to many venture capitalists' tendency for self promotion but also to a more fundamental issue the industry has struggled with since its inception, namely the best metrics to use to report its financial performance. The issue has proven a very difficult one to tackle by the academic and the professional communities alike, due to a unique combination of factors such as: (1) the basic difficulties in valuing venture capital investments (mostly minority stakes in restricted stocks of early stage, technology-rich companies), which test the limits of standard valuation techniques; (2) IRR-boosting cash flow management techniques, such as the progressive drawdown of the fund commitments; and (3) the very private nature of the industry, where reported numbers are often aggregations of self-reported rates of returns.

In this chapter, we offer to review the documented drivers of venture capital performance and the issues related to financial metrics in the venture capital industry, offering a critical perspective on the limitations inherent in the system. The ultimate objective is to develop a grounded understanding of the performance dilemmas in the venture capital industry, more than it is to 'explain' variations in performance. While no comprehensive study exists to 'explain' fund performance, a growing body of evidence points to key drivers, both endogenous and exogenous.

Performance in venture capital: a four-level approach

The literature on the drivers of venture capital fund performance has been relatively scarce, partly due to the difficulty to access the fund-level data, which is normally only provided to limited partners in the funds and, partially, to national venture capital associations. On the other hand, a rich literature has developed to examine the performance of venture capital-backed companies, as well as the determinants of successful venture capital investing, including the structural conditions in which it would thrive and the benefits as seen from the entrepreneurial perspective.

We use four complementary approaches to address the performance issue. First, at a micro (deal) level, we review the literature on key drivers of venture capital performance. This literature focuses mostly on how venture capitalists add value to entrepreneurial ventures. Second, we take a fund-level perspective and investigate the evidence regarding performance there. Third, we take a macro perspective (industry level) and review the evidence as to actual aggregated industry performance. Finally, we review generic issues with performance measurement in the venture capital context.

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The key messages in the critical review fall into three categories. First of all, the nature of the industry, and in particular the types of deals done, puts severe constraints on the very ability to measure value creation and hence performance over time. These factors are ingrained in the mesh of the industry, and thus to be taken as invariable. Second, structures have emerged to deal with the nature of the deals, themselves contributing to the variability of the returns. Finally, while the limitations inherent in performance reporting in this context are material, they do not prevent an efficient functioning of the industry. An expected contribution of this chapter is to highlight the conditions precedent to industry practices and hopefully to provide a solid basis for the necessary interpretation of the numbers provided by the industry. This re-balancing of expectations is a pre-requisite for a healthy, sustainable venture capital industry.

Value drivers in venture capital deals

The largest part of the venture capital literature actually investigates key drivers of performance in venture capital-backed deals. We separate the presentation into three categories: (1) venture capital-controlled investment factors; (2) environmental factors; and (3) decision making processes.

Venture capital-controlled investment factors

Deal flows, screening and syndication Rigorous company and investment selection processes, including proprietary deal flows, deal flow quality and quantity, screening and syndication abilities are said to impact the performance of funds positively.

Birkshaw and Hill (2003) support the view that syndication may allow investors to make decisions regarding investments based on multiple judgements by other parties, thereby (potentially) enhancing the accuracy of screening through the incorporation of greater experience and impartiality into the process. Corporate venture units may be able to more greatly diversify their risk by utilizing co-investment tactics for a defined amount of financial investment. Active participation in a community of investors may allow corporate venture units to avoid problems of adverse selection and to attain access to an enhanced deal flow. Involvement in a community of investors may provide a corporate venture unit with the opportunity to search more distant knowledge domains with reduced transaction costs, thereby accessing a greater volume of novel investment opportunities.

Hochberg et al. (2004) show that venture capitalists tend to syndicate their investments with other venture capitalists rather than investing alone. Once they have invested in a company, venture capitalists draw on their networks of service providers – head hunters, patent lawyers, investment bankers and so on – to help the company succeed. The two main drivers of venture capital performance are the ability to source high quality deals and to nurture the investments. Syndications support both critical activities. Syndication networks facilitate the sharing of information, contacts and resources amongst venture capitalists. Strong relationships with other venture capitalists are likely to improve the chances of securing follow on venture capital funding for portfolio companies, and may indirectly provide access to other venture capitalists' relationships with service providers such as head hunters and prestigious investment banks.

Controlling for other known determinants of venture capital fund performance such as fund size as well as the competitive funding environment and the investment opportunities

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facing the venture capitalist, the authors find that venture capitalists that are better networked at the time a fund is raised subsequently enjoy significantly better fund performance, as measured by the rate of successful portfolio exits over the next ten years. Perhaps the leading alternative explanation for the performance enhancing role of venture capitalist networking is simply experience. It seems plausible that the better networked venture capitalists are, also the older and more experienced the venture capitalists. Venture capital funds whose parent firms enjoy more influential network positions have significantly better performance as well. Similarly, the portfolio companies of better networked venture capital firms are significantly more likely to survive to subsequent rounds of financing and to eventual exit. Interestingly, once network effects are controlled for in the models of fund and portfolio company performance, the importance of venture capitalist prior experience is reduced, and in some specifications, eliminated. Given the authors' documented large returns to being well networked, enhancing a network position should be an important strategic consideration for an incumbent venture capitalist, while presenting a barrier to entry for new venture capitalists.

Engel (2004) stresses the value of syndication as a successful strategy to overcome problems of information asymmetries. A public promotion of syndication can be helpful for supporting the learning process of venture capitalists, for increasing the quality of the value chain process and hence for pushing up the capital inflow by investors. Gompers and Lerner (2001), for their part, argue that by syndicating investments, venture capital firms can invest in more projects and largely diversify away firm-specific risk. Involving other venture firms also provides a second or third opinion on the investment opportunity, which limits the danger that bad deals will get funded.

Control mechanisms Venture capitalists have developed over time a sophisticated toolbox of structural and contractual arrangements to help manage difficult features of their transactions, such as high levels of uncertainty about future outcomes and large information asymmetries between the parties involved. Contingent control rights, which include continuous monitoring processes (such as positions on the Board, reporting requirements, and so on), the ability to replace the entrepreneur, powerful stock option compensations, investor liquidation rights, and the use of convertible securities have all been presented as critical drivers of performance in individual deals.

Hege et al. (2003) focus on the significant performance gap between US and European venture capitalists, both in terms of types of exits and of rates of return realized. The authors partly attribute the gap to differences in the contractual terms of the relationship, like the frequency and effectiveness of the use of instruments asserting an active role of venture capitalists in the value creation process. Venture capitalists in the US assert vigorously contingent control rights, through systematic use of financial instruments that convey residual control rights in case of poor performance, such as convertible securities, and they activate these controls more frequently, as measured by the replacement of entrepreneurs. Also, US venture capitalists exhibit sharper screening skills than their European counterparts. A better average quality of selected projects in the US is said to be consistent with the finding that a larger fraction of the total investments occur there in the initial round. Finally, there is some evidence for a more effective management of financing relationship and participation of different groups of investors in the US. Interestingly, the results also suggest that relationship financing,

which is more pronounced for European companies, does not have any significant impact on performance.

Kaplan and Strömberg (2003) focus on the agency problems inherent in contract design. The external risk results suggest that risk-sharing concerns are unimportant relative to other concerns, such as monitoring. Venture capitalists expect to take actions with their investments and those actions are related to the contracts. Venture capital management intervention is related to venture capital board control while venture capital support or advice is shown to be more related to venture capital equity ownership.

Gompers and Lerner (2001) investigate the tools used by venture firms to address the information issues. These are said to include intense scrutiny before and after the provision of capital. The monitoring and information tools used include meting out financing in discrete stages over time, syndicating investments with other venture capital firms, taking seats on a firm's board of directors, and compensation arrangements including stock options. Lerner (1995) similarly found evidence that board service is driven by a need to provide monitoring, showing that geographic proximity is an important determinant of venture board membership. Another mechanism utilized to influence managers and critical employees is to have them receive a substantial fraction of their compensation in the form of equity or options.

General partner experience The industry knowledge and experience of the General Partners (GP), including access to and degree of implicit and tacit knowledge as well as the degree of specialization has been shown to impact the performance of funds.

Gompers (1994) shows that unseasoned venture capital firms (those that have been in existence five years or less) are under tremendous pressure to perform during the initial stages of their first fund. These inexperienced venture capitalists have an incentive to 'grandstand', or to bring firms from their first fund to the public market sooner than would otherwise be optimal. On average, young venture capitalists lose almost \$1 million on each initial public offering because they bring the companies to market too early.

Kaplan and Schoar (2005) show that venture capital returns persist strongly across funds raised by individual private equity partnerships. Performance increases (in the cross section) with fund size and with the GPs' experience. The relation with fund size is concave, suggesting decreasing returns to scale. Similarly, a GP's track record is positively related to the GP's ability to attract capital into new funds. This is also supported by Gottschalg et al. (2004) who show that the main drivers of underperformance are funds that are small, European and run by inexperienced GPs. Engel (2004) similarly finds that large, older venture capital companies with access to implicit, tacit knowledge have a higher quality of the value chain process.

Persistence of performance, timing and investment durations Kaplan and Schoar (2005) document substantial persistence in leverage buy-out (LBO) and venture capital fund performance. General partners whose funds outperform the industry in one fund are likely to outperform the industry in the next, and vice versa. Persistence is found not only between two consecutive funds, but also between the current fund and the second previous fund. These findings are markedly different from the results for mutual funds, where persistence has been difficult to detect, and when detected, tends to be driven by persistent underperformance rather than over-performance. Fund flows are positively

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related to past performance, however the relationship is concave in private equity. Similarly, new partnerships are more likely to be started in periods after the industry has performed especially well. But funds and partnerships that are raised in boom times are less likely to raise follow-on funds, suggesting that these funds perform poorly. A larger fraction of fund flows during these times, therefore, appears to go to funds that have lower performance, rather than top funds. Not only do more partnerships decide to start up after a period in which the industry performed well, but also, first time funds tend to raise bigger amounts of capital when the private equity industry performed well. Funds raised in boom years are more likely to perform poorly and therefore are unable to raise a follow-on fund. In sum, it appears that the marginal dollar invested in boom times goes towards financing funds which are less likely to be able to raise a subsequent fund. In periods of increased entry of funds into the industry overall, the authors observe a larger negative effect on the young funds, than on the older, more established funds.

Reputation of fund and general partners Nahata (2004) shows that venture capitalist reputation has a positive impact on the profitability of harvesting venture investments – as venture capitalists are able to attract higher tier underwriters, and companies backed by reputable venture capitalists are able to time IPOs near stock market peaks. High quality affiliation also has a strong and positive effect on young companies' valuations at the time of IPO.

Kaplan and Schoar (2005) base their analyses on the premise that the underlying heterogeneity in general partners' skills and competences should lead to heterogeneity in performance and to more persistence if new entrants cannot compete effectively with existing funds. Several forces make it difficult to compete with incumbents. First, many practitioners assert that unlike mutual fund and hedge fund investors, private equity investors have proprietary access to particular transactions, that is 'proprietary deal flow'. In other words, better GPs may find better investments. Second, private equity investors typically provide management or advisory inputs along with capital. If high quality general partners are scarce, differences in returns between funds could persist. Third, there is some evidence that better venture capitalists get better deal terms (for example lower valuations) when negotiating with start-ups.

Value added services Value added services provided to the investee companies, such as advisory services (including position on the Board, assistance with recruiting and compensating management, development/revision of business plan/strategies) and the utilization of syndication networks may improve the returns on investments.

Kaplan and Strömberg (2000) point out that the venture capitalists expect to be active in areas such as developing the business plan, assisting with acquisitions, facilitating strategic relationships with other companies, or designing employee compensation. However, while venture capitalists play a monitoring and advisory role, they do not intend to become too involved in the company. Hege et al. (2003) find evidence supporting the view that venture capital firms in Europe are more deal makers and less active monitors, lagging in their capacity to select projects and add value to innovative firms. In Chapter 7, De Clercq and Manigart revisit the evidence on the value added of venture capitalists.

Multistage investment The ability of venture capitalists to come back to fund successive stages of a venture is presented as another means used to leverage performance.

Gompers and Lerner (2001) show that staged capital infusions may be the most potent control mechanism a venture capitalist can employ. Staged capital infusion keeps the owner/manager on a tight leash and reduces potential losses from bad decisions.

Kaplan and Strömberg (2000) show it is common for a venture capitalist to make a portion of its financing commitment contingent on subsequent portfolio company actions or performance. This reduces the amount of funds that the venture capitalist has put at risk for a given investment and gives greater ability to the venture capitalist to liquidate the venture by not providing funds if performance is unsatisfactory. Higher management risk and market risk leads to greater use of state contingent contracting and staged investment commitment.

Environmental factors

A number of structural and environmental factors have also been shown to impact the reported performance of venture capital firms' performance (Wang and Ang, 2004).

Availability and status of public markets for IPOs The availability and status of public markets for initial public offerings strongly influences the reported performance of the industry.

Gilson and Black (1999) show that an active stock market is important for a strong venture capital industry because of the potential for venture capital exit through IPOs. Jeng and Wells (2000) examine the factors that influence venture capital fundraising internationally. The strength of the IPO market is an important factor, however it does not seem to influence commitments to early stage funds as much as later stage ones. Both Gilson and Black (1999) and Jeng and Wells (2000) see access to strong IPO markets as the key source of US competitive advantage in venture capital, as well as Cochrane (2000) and Gompers and Lerner (1998).

Jeng and Wells (2000) also show that an increased volume of IPOs has a positive effect on both the demand and supply of venture capital funds. On the demand side, the existence of an exit mechanism gives entrepreneurs an additional incentive to start a company. On the supply side, the effect is essentially the same. Large investors are more willing to supply funds to venture capital firms if they feel that they can later recoup their investment.

Gompers and Lerner (2001) show that venture capitalists take firms public at market peaks, relying on private financings when valuations are lower. Seasoned venture capitalists appear more proficient at timing IPOs. The superior timing ability of established venture capitalists may be in part due to the fact that they have more flexibility as to when to take companies public. Less established groups may be influenced in this decision by other considerations – for instance young venture capital firms have the incentives to grandstand.

Nahata (2004) points out that successful exits are critical to ensuring attractive returns for investors and in turn to their raising additional capital. The choice of exit vehicle is governed by both firm-specific and VC-specific factors. Better performing portfolio companies not only lead to more successful exits (IPOs or acquisitions) but even among those two exit scenarios, relatively better performers are more likely to be taken public than sold to an acquirer. This is in line with the finding by Gompers and Lerner (2001) that IPOs tend to yield higher return.

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Overall economic cycle The investment opportunities available in the context of the competitive environment significantly determine venture capital performance.

Gompers and Lerner (2001) suggest that the valuation of individual deals is affected by overall macroeconomic conditions and the degree of competition in the venture capital industry. When a surge of money enters the venture capital industry, but there are only a certain number of worthy projects to finance, the result can be a substantial decline in the returns on investment in the industry. This results in 'too much money chasing too few deals'.

Inflows of venture capital tend to raise valuations. In the past, overinvestment by venture capitalists led to too many projects at too high valuations resulting in low returns. Increases in demand can, in the short run, only be met by existing funds which accelerate their investment flows and earn excess returns. Increases in supply lead to tougher competition for deal flow, and private equity fund managers respond by cutting their investment spending. Supply increases possibly indicate overheating accompanied by poorer performance.

Ljungqvist and Richardson (2003) show that the competitive environment facing fund managers plays an important role in how they manage their investments. During periods in which investment opportunities are good, existing funds invest their capital and exit their investments more quickly, taking advantage of the favourable business climate. This tends to lead to better returns on their investments. In contrast, when facing greater competition from other private equity funds, fund managers draw down their capital more slowly and hold their investments for longer periods of time. Returns on investment undertaken when competition was tougher are ultimately significantly lower.

Gottschalg et al. (2004) support the view that there was a substantial amount of money chasing too few deals in Europe and that part of the observed European underperformance is explained by this aspect. Fund performance is very sensitive to both business cycles and stock market cycles.

Regulatory environment The regulatory environment faced by the venture capital industry, in particular capital gains tax rates, the evolution of interest rates (long and short term), labour market rigidities and information reporting requirements, can all impact on performance.

Gompers and Lerner (1998) investigate aggregate performance and capital flows. The authors find that macroeconomic factors like past industry performance and overall economic performance as well as changes in the capital gains tax or ERISA provisions (see Chapter 1 for a review of the development of venture capital in the US) are related to increased capital flows into private equity. Lower capital gains taxes seem to have a particularly strong effect on the amount of venture capital supplied by these tax-exempt investors. The impact of the capital gains tax does not arise through its effect on those supplying venture capital, but rather by spurring corporate employees to become entrepreneurs, leading to more demand for venture capital.

Jeng and Wells (2000) also highlight the fact that if the market does not have good information on small start-up firms, then investors will demand a high risk premium, resulting in more expensive funding for these companies. This cost of asymmetric information can be reduced if the country in which the company operates has strict accounting standards. With good accounting regulation, venture capitalists need to spend less time gathering information to monitor their investments.

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Gompers and Lerner (2001) show that government policy can have a dramatic impact on the current and long-term viability of the venture capital sector. In many countries of continental Europe, entrepreneurs face numerous daunting regulatory restrictions, a paucity of venture funds focusing on investing in high growth firms, and illiquid markets where investors do not welcome IPOs by young firms without long histories of positive earnings.

Despite wide recognition of venture funds as key players underlying a country's entrepreneurial performances, there are huge differences across industrialized countries in the relative amounts invested in venture capital. Jeng and Wells (2000) show that labour market rigidities, the level of IPOs, government programmes for entrepreneurship and bankruptcy procedures explain a significant share of cross country variations in venture capital intensity.

Leleux and Surlemont (2003) highlight the role played by direct state interventions in the venture capital market across Europe. Their evidence is consistent with state interventions coming in after the emergence of a venture capital industry and to a large extent validating the industry, leading to higher private capital flows into the venture capital industry. They could not support the traditional view that state interventions prime the market, nor could they find evidence that public interventions crowded out private capital.

Romain and Van Pottelsberghe de la Potterie (2004) show that indicators of technological opportunity, such as the stock of knowledge and the number of triadic patents affect positively and significantly the relative level of venture capital activity. Labour market rigidities reduce the impact of the GDP growth rate and of the stock of knowledge, whereas a minimum level of entrepreneurship is required in order to have a positive effect of the available stock of knowledge on venture capital intensity.

Availability of investors Jeng and Wells (2000) find that the level of investment by private pension funds in venture capital is a significant determinant of venture capital over time but not across countries. Using mutual funds as a benchmark, studies by Sirri and Tufano (1998) and Chevalier and Ellison (1999) indicate that funds that outperform the market experience increased capital inflows. This relationship tends to be convex; mutual funds with above-average performance increase their share of the overall mutual fund market, something shown for private equity by Kaplan and Schoar (2005). The latter show that capital flows into private equity funds are positively and significantly related to past performance. Fund size is positively and significantly related to the performance of the previous fund.

Decision making processes by venture capitalists

Hatton and Moorehead (1994) showed that the quality of the entrepreneur ultimately determines the funding decision. Venture capitalists expect the product to be capable of high profit margins and to provide exit strategies. Three criteria were shown as heavily weighted by venture capitalists: (1) the degree of market acceptance for the product; (2) the return potential; and (3) the need for subsequent investments.

Leleux et al. (1996) use binary conjoint analysis to formally investigate for the first time the decision tree of venture capitalists across Europe. Using a comprehensive list of investment criteria, they point out four major 'types' of investor, the largest one focusing primarily on human factors.

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Venture capitalists have also been shown to be subject to a number of decision-making biases. Zacharakis and Shepherd (2001) prove experimental evidence of their possible overconfidence, dependent upon the amount of information, the type of information, and whether the venture capitalist strongly believes the venture will succeed or fail. Overconfidence describes the tendency to overestimate the likely occurrence of a set of events. Overconfident people make more extreme probability judgements than they should, and overconfident venture capitalists may overestimate the likelihood that a funded company will succeed. The authors show that venture capitalists are intuitive decision makers, and when people are familiar with a decision and the structure of the information surrounding that decision, they resort to automatic information processing. It seems that forcing them outside their comfort zone has a negative effect on their confidence and has an even greater effect (negative) on their accuracy. Venture capitalists rely on how well the current decision matches past successful or failed investments. The supported high level of overconfidence in success or failure predictions may encourage the venture capitalist to limit information search and fund a lower potential investment (or prematurely reject a stronger potential investment). Overconfident venture capitalists may not fully consider all relevant information, nor search for additional information to improve their decision. Moreover, the natural tendency for people to recall past successes rather than failures may mean that venture capitalists will make the same mistakes again. Venture capitalists evaluate hundreds of data points during venture screening and due diligence which can lead to information overload (Zacharakis and Meyer, 2000) – as venture capitalists are drawn to more salient information factors and may ignore other factors that are more pertinent to the decision.

Shepherd and Zacharakis (2002) also document the fact that venture capitalists rarely use decision aids, where bootstrapping models have the potential to improve venture capitalists' decision accuracy, improving consistency, reducing the bias caused by a non-random sample, and by optimally weighting information factors and reducing the decision maker's cognitive load. Decision aids also allow venture capitalists to acquire expertise faster than do current educational and training methods. Decision aids can provide cognitive feedback, which is the return of some measure of the person's cognitive processes used in the decision. Cognitive feedback helps people come to terms with their decision environment and has been found to be markedly superior to outcome feedback.

Zacharakis and Shepherd revisit in Chapter 6 the latest evidence on venture capital decision making.

A fund level perspective on venture capital risk – return performance

Research specifically concerning the returns to private equity has focused on describing the basic risk/return profiles of investments in private equity partnerships and private equity investments in companies, as documented by Hand (2004).

Stevenson et al. (1987), in a pioneering study, highlight the following conditions which lead to high rates of return on venture capital funds: (1) a multistage investment or commitment of funds on an incremental basis with evaluation of venture performance before commitment of additional funds; (2) an objective evaluation of venture performance with the clear distinguishing of winners from losers; (3) parlaying funds or having the confidence to commit further funds to ventures identified as winners; (4) a persistence of returns from one round to the next, which implies that valuable information is gained

from previous rounds of investment in the same venture; and (5) long term holding of investment portfolios for a period sufficient for geometric averaging of compound returns to cause winners to take over or raise portfolio returns.

Ljungqvist and Richardson (2003) report that the risk adjusted excess value of the typical private equity fund is in the order of 24 per cent relative to the present value of invested capital, probably because of the highly illiquid nature of the fund. Cochrane (2000) characterizes venture capital returns based on the economics of individual investments in portfolio companies. He finds that venture returns are very volatile, with later stage deals showing much less volatility than early stage deals.

Gottschalg et al. (2004) support the opposite view on performance: PE funds in their sample (raised between 1980 and 1995) seem to under-perform public stock markets. PE performance is higher when investments are exited in periods of high valuation levels on public stock markets, as proxied by the overall earning to price ratio. The authors also show that PE funds are exposed to substantial 'left tail' risk, that is they deliver significantly higher losses during large market downturns but are not as sensitive to economic conditions in good times.

Lerner et al. (2004) support the view that the returns realized from private equity investments differ dramatically across investor groups. In particular, endowments' annual returns are nearly 14 per cent greater than average. Funds selected by investment advisors and banks lag sharply. These results were robust to controlling for the type and year of the investment, as well as the use of different specifications.

Kaplan and Schoar (2005), on a sample of funds active over the period 1980–1997, show average fund returns net of fees roughly equal to those of the S&P 500. Weighted by committed capital, venture funds outperform the S&P 500 while buyout funds do not. The authors suggest that gross of fees, both types of private equity partnerships earn returns exceeding the S&P 500. While LBO fund returns net of fees are slightly less than those of the S&P 500, VC fund returns are lower than the S&P 500 on an equal weighted basis, but higher than the S&P 500 on a capital weighted basis. They also show that performance persists strongly across funds raised by individual partnerships and improves with partnership experience.

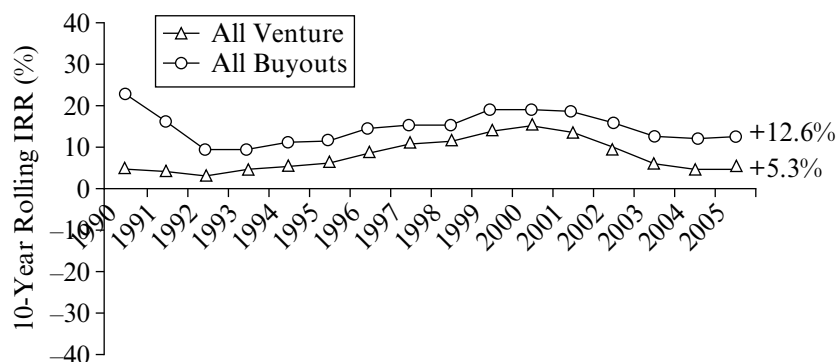
The industry level evidence: is venture capital delivering?

The European venture capital scene was seriously shaken on its foundations by the publication in early 2005 of the benchmark returns for the industry, presented below in Table 9.1 and Figure 9.1. For the first time in its relatively short history, the average 10-year investment horizon returns for early stage investments became negative on a per annum basis. For all venture capital classes, including development and balanced funds, the performance was an equally unimpressive 5.3 per cent for the period. The pooled cumulative returns since inception for funds created since 1980 showed practically a zero return.

The latest figures reported by the National Venture Capital Association (NVCA) for the US showed an average 10-year investment horizon return of 45.8 per cent per annum and a 20-year investment horizon return of 19.8 per cent, as shown in Table 9.2. The broader venture capital class, including also vehicles focusing on development capital, showed respectively figures of 25.4 per cent and 15.6 per cent for the 10- and 20-year investment horizons. The differentials between the European and US performance figures in terms of early-stage deals were the largest reported in the last 20 years.

246 *Handbook of research on venture capital**Table 9.1 European investment horizon returns as of 31 December 2005 (in per cent per annum)*

Net Horizon Returns as of 31 December 2005				
Stage	1-year IRR %	3-year IRR %	5-year IRR %	10-year IRR %
Early-Stage	4.9	-2.3	-7.5	-0.1
Development	12.2	0.9	-1.6	8.8
Balanced	32.7	2.8	-2.7	7.6
All Venture	25.4	0.6	-4.0	5.3
Buyouts	20.9	7.9	5.0	12.6
Generalist	51.2	1.2	-4.8	9.7
All Private Equity	24.1	5.2	1.2	10.2

*Figure 9.1 European 5-year rolling window IRRs as of 31 December 2005 (in per cent per annum)*

These comparative numbers are intriguing. First, they seem to support the view that the industries in the US and Europe are at very different stages of their development. European venture capital industry emerged in the early 1990s, and only faced its first downturn when the Internet bubble burst. In other words, it never really had a chance to learn. The poor results indicate a painful 'teething' problem by an emerging industry. Second, it appears that the lessons from the natural selection process that led to a strong performing US industry were either not transferable or not adopted by its European counterpart.

Generic issues with industry performance measurement

These industry statistics clearly warrant further investigations. Both the absolute performance level of European venture capital and relative to the US industry is intriguing. In this section, we focus on issues related to the measurement of performance in venture capital.

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Table 9.2 US investment horizon returns as of 31 December 2004 (in per cent per annum)

Venture Economics' US Private Equity Performance Index (PEPI)					
Fund Type	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr
Early/Seed VC	1.4	−5.5	−8.6	45.8	19.8
Balanced VC	5.8	1.2	−4.2	17.0	13
Later Stage VC	−0.4	0.6	−6.6	15.2	13.7
All Venture	3.6	−1.4	−6.3	25.4	15.6
Small Buyouts	24.1	5.4	1.6	8.7	26.7
Med Buyouts	17.8	4.3	−3.2	10.6	17.7
Large Buyouts	16.8	9.6	0.9	10.9	14.5
Mega Buyouts	20.6	9.0	2.7	7.7	9.7
All Buyouts	19.8	8.5	1.8	8.7	13.0
Mezzanine	8.5	3.7	1.8	6.9	9.2
All Private Equity	14.0	5.3	−0.5	12.5	13.8
NASDAQ	0.3	2.7	−15.3	9.4	11.4
S&P 500	4.8	1.0	−4.7	9.0	10.8

Notes: * The Private Equity Performance Index is based on the latest quarterly statistics from Thomson Venture Economics' Private Equity Performance Database analysing the cash flows and returns for over 1750 US venture capital and private equity partnerships with a capitalization of \$585 billion. Sources are financial documents and schedules from Limited Partners investors and General Partners. All returns are calculated by Thomson Venture Economics from the underlying financial cash flows. Returns are net to investors after management fees and carried interest. Buyout funds sizes are defined as the following: Small: 0–250 \$Mil, Medium: 250–500 \$Mil, Large: 500–1000 \$Mil, Mega: 1 Bil+

Source: Thomson Venture Economics/National Venture Capital Association

Issue #1: Valuing early stage companies

We define venture capitalists as risk capital, that is equity-like, investors in young, rapidly growing companies that have the potential to develop into significant economic contributors. Their willingness to take the risks associated with such investments is driven by their beliefs that they can generate superior returns, even after adjusting for the risks prevailing in these settings. By providing critical early capital and hands-on supervision and advice, aggressively managing their portfolio (divesting poorly performing assets and reinvesting in successful ones over time), and racing to the most profitable exits, they represent, in the words of Gompers and Lerner (2000), the 'Money of Invention'. How much is created thus depends on the value increase from the time of the investment(s).

The first issue to be tackled in measuring financial returns to venture capital activities is thus the valuation of early-stage, privately held companies. The valuation exercise is rarely conducted in the context of a 'market' in the economics sense, not even a very imperfect one. First of all, the number of potential participants on either side of the deal (buyers or sellers) is too small to justify the term of market. In many instances, a single buyer and a single seller will be involved. Second, efficient markets suppose the existence of sufficient information for both parties to properly evaluate the entity to be traded. Unfortunately, the amount and quality of information available to estimate the true worth of a private entity is often very limited. The typical valuation context is then one

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of bargaining under incomplete and asymmetric information, a field of study that has received a great deal of attention from academics but has so far not been able to come up with more than general guidance on how to put a price on a firm.

New valuation guidelines have been adopted recently by the industry, focusing on the concept of Fair Value (EVCA Valuation Standards, 2005), also known as Fair Market Value or cash value in the US (PEIGG Valuation Guidelines, 2004). EVCA defines Fair Value as the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction. The estimation of Fair Value does not assume either that the underlying business is saleable at the reporting date or that its current shareholders have an intention to sell their holdings in the near future. The objective is to estimate the exchange price at which hypothetical market participants would agree to transact. Fair Value is not the amount that an entity would receive or pay in a forced transaction, involuntary liquidation or distressed sale. Although transfers of shares in private businesses are often subject to restrictions, rights of pre-emption and other barriers, it should still be possible to estimate what amount a willing buyer would pay to take ownership of the investment.

In estimating Fair Value for an investment, EVCA recommends a 'methodology that is appropriate in light of the nature, facts and circumstances of the investment and its materiality in the context of the total investment portfolio and should use reasonable assumptions and estimates'. This definition stresses the subjective nature of private equity investment valuation. It is inherently based on forward-looking estimates and judgements about the underlying business itself, its market and the environment in which it operates, the state of the mergers and acquisitions market, stock market conditions and other factors. Due to the complex interaction of these factors and often the lack of directly comparable market transactions, judgement needs to be exercised. Ultimately, it is only at realization that the true performance of an investment is apparent.

Issue #2: Extensive use of contingent valuation techniques

Standard valuation methodologies, from discounted cash flows to earnings multiples and real option formulae, are only as good as the fundamental assumptions and data used to feed them, that is in general very poor. The high level of uncertainty that prevails in the world of venture capital is an intrinsic part of that world, and will not disappear. Hence the very slow adoption of the most sophisticated valuation techniques, which are for the most part seen as 'technical overkill'. Early stage financings (venture capital, angels, and so on) have earned a very distinctive (and deserved) reputation as some of the more obscure, if not outright esoteric, dimensions of the field. Start-up firms are a study in paradox, known as much for the passion and drive of their wizard-driven teams, the revolutionary technologies they hatch and their blind pursuit of the opportunities they generate as for their bad habit of failing in droves, burning cash as if there were no tomorrow, and ultimately not delivering the promised bounties, or only after excruciating delays and sufferings. So, how does one go about analysing and providing financing to such 'outliers' in terms of financial risk? To a large extent, the inevitable valuation inaccuracies and differences of opinion are 'hedged' through sophisticated contracting schemes which, in effect: (1) provide for 'contingent repricing' through time as the venture develops, reallocating cash flow and control rights when need be; and (2) provide effective screening and incentive mechanisms, helping to 'smoke

out' entrepreneurs with lesser quality projects or venture capitalists with low add-on values (Cossin, Leleux and Saliasi, 2003).

While there is comfort in knowing that initial valuation errors will be corrected over time, how should venture capitalists report actual deal valuations for the purpose of financial performance measurement? A first conceptual approach would be to value independently the multiple options that make up standard investment contracts. But for the very same reasons that valuations are difficult, derivative valuations are even more uncertain. A second approach, less elegant but more applicable, consists in ignoring the contractual contingencies and reporting only the point valuations (that is share prices) at the time of the deal. While this ignores most of the value-related covenants, the valuation error would only affect the initial reporting of the deal value: upon exit, the true value creation will be recognized.

Issue #3: IRR-boosting cash flow management techniques

Measuring the financial performance of a venture capital fund requires taking into consideration the industry's unique set of operating procedures which impact these reported performances. The latter include: (1) the progressive commitments, draw-downs and investments of funds from investors into ventures; (2) the selective re-investments and divestments from ventures; and (3) the exits and distributions to investors. All the parameters of the investment cycle are managed by the venture capitalists to optimize not only reported IRRs on the fund but also the investment multiple, the two key performance metrics most watched in the industry.

Venture capitalists' need to manage IRR translates into a progressive commitment and drawdowns of the investors' funds. The 'clock', in terms of return on capital, only starts ticking when the venture capitalist has the use of investors' money in hand, hence a great reluctance to take the commitments in cash upfront. Funds either draw down the funds on the basis of a fixed schedule (for example 12 equal quarterly instalments) or more often on the basis of cash calls on an as-needed basis, with a 30- to 90-day payment basis.

Venture capitalists' insistence on progressive capital commitment to a venture is not only a risk management and control tool but also a cash disbursement mechanism. Associated with direct monitoring of the ventures, the objective is to minimize the period of capital usage and maximize its value creation efficiency.

At the end of the process, venture capitalists need to exit the investments and distribute the proceeds back to investors (Leleux, 2002). Exits happen in a number of ways: a private recapitalization, a merger with or sale to an acquirer, or in a public offering (IPO). The exit strategy most frequently chosen in the US is a public offering, otherwise known as an IPO, since an IPO will provide investors with the highest overall returns. Once the investment is exited, the venture capital firm must then decide when and how to distribute the returns to its investors. A venture capital firm can either sell the stock and distribute the cash proceeds to the investors or it can distribute the stock directly to the investors. Stock distributions are most commonly selected because they provide the greatest benefits to the fund's limited partners. Due to Securities and Exchange Commission (SEC) restrictions, a venture capitalist cannot easily liquidate its entire position. In instances when it can sell stock, a large block sale by a venture capitalist would negatively impact the stock price. However, a venture capital firm can distribute the shares of a portfolio company to its limited partners, who can then sell these shares without restriction.

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If an investor still believes in the long-term prospects of the company, he can also hold the stock for sale at a later date. Another benefit of this strategy is that a tax liability is not created until the stock is actually sold. Clearly, the above evidence supports the claim that a venture capitalist chooses a stock distribution for the benefits it provides to investors.

As with most debates, there is another perspective to the distribution strategies chosen by venture capitalists and that is one which is self-serving. In taking a portfolio company public, a young venture capital firm improves its fundraising prospects (Gompers, 1996). By distributing shares instead of cash, a venture capitalist can increase its compensation, satisfy its largest institutional clients, and increase its overall personal return on investment.

Issue #4: Collecting and aggregating individual fund IRRs

Venture capital funds belong to the generic 'private equity' or 'alternative assets' portfolio allocation class. By definition, that industry deals primarily with private equity situations, that is situations where information disclosures are going to be extremely limited. In practice, only limited partners in a fund would receive detailed information as to the actual performance of the fund they are invested in. Only large institutional investors, such as major university endowments or fund-of-fund managers would ever accumulate a sufficiently large number of positions in funds to be able to generate meaningful comparisons internally. A number of trade groups, such as EVCA and NVCA, often with the help of specialist advisory boutiques, such as Venture Economics or Almeida Capital, are generating their own 'industry' performance numbers. In doing so, they face the same difficulties in accessing the basic fund performance information and have to rely on voluntary disclosure by member firms. For example, EVCA and PricewaterhouseCoopers tapped all national private equity and venture capital associations to identify all companies that participated in private equity activities during 2002 (for the 2002 Annual European Private Equity Survey, published as the 2003 EVCA Yearbook). A total of 1528 eligible companies were contacted and 73 per cent of the firms, or 1112, responded to the two-part, self-completion survey. While it would be difficult to criticize the organizations for the non-respondents, it is fair to question whether self-disclosure leads to censoring of the performance distribution curve, for example if non-respondents were primarily funds with low performance during the year.

Issue #5: Industry performance and correlation with other asset classes

Performance and risk can only be evaluated in the context of the correlation of the venture capital asset class with respect to other major sectors. In particular, if venture capital exhibited a low level of correlation with respect to these assets, a high proportion of its risk can be diversified away in a well-balanced portfolio. Unfortunately, the evidence in this respect is not as encouraging as some would pretend. First of all, the performance of the venture capital industry is highly correlated to that of technology-rich stock markets, so that venture capital positions do not provide much diversification to a Nasdaq-rich portfolio. The best diversification is obtained with respect to portfolios of real estate or long-term fixed income instruments. Correlations to key equity indices are in general positive and relatively high (0.5 to 0.7), so that the benefits in including venture capital in the portfolio are actually relatively minimal.

Conclusions

In this chapter, we document the extent of contributions to understanding the issues in measuring performance in the venture capital industry. In particular, we highlight the unreliability of the performance measures in general and the difficulty to access fund level data. Despite these shortcomings, a rich literature has emerged to identify key drivers of performance at the fund level or at the level of the investee companies.

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